What is claimed is:

1. A method for convolutionally encoding digital data for transmission over a communication channel, comprising the step of:

processing said data using one of a 64-state, rate 1/2 binary convolutional code (BCC) based on octal generators 133, 175 or a 256-state, rate 2/3 BCC based on octal generators $\begin{pmatrix} 21,02,12 \\ 10,25,12 \end{pmatrix}$ to provide binary convolutional coded codewords.

2. A method in accordance with claim 1 comprising the further step of:

scrambling said codewords prior to transmission over said communication channel.

3. A method in accordance with claim 2 wherein said codewords are encoded jointly onto in-phase (I) and quadrature (Q) channels.

4. A method in accordance with claim 2 wherein:

said codewords are mapped to a constellation according to a pseudo-random scramble sequence

comprising bits having one of first and second binary values;

in the event a bit of the scramble sequence has said first binary value, maintaining said constellation in a current relationship with respect to constellation axes; and

in the event a bit of the scramble sequence has said second binary value, rotating said constellation by ninety degrees.

5. A method in accordance with claim 4, wherein said constellation is rotated counterclockwise in the event said bit of the scramble sequence has said second binary value.

Sub a3

6. A method in accordance with claim 5 wherein said scramble sequence is generated from a seed sequence 0011001110001011, where the first bit of the sequence in time is the left most bit.

7. Apparatus for encoding data for use in digital communications systems comprising:

a binary convolutional encoder; and

a scrambler for scrambling codewords provided by said encoder prior to transmission over a communication channel.

8. Apparatus in accordance with claim 7, wherein said scrambler is responsive to a scramble pattern generator.

9. Apparatus in accordance with claim 7 wherein said codewords are encoded jointly onto in-phase (I) and quadrature (Q) channels.

10. Apparatus in accordance with claim 7 wherein:

said codewords are mapped to a constellation according to a pseudo-random scramble sequence comprising bits having one of first and second binary values;

in the event a bit of the scramble sequence has said first binary value, maintaining said constellation in a current relationship with respect to constellation axes; and

in the event a bit of the scramble sequence has said second binary value, rotating said constellation.

11. Apparatus in accordance with claim 10, wherein said constellation is rotated counterclockwise in the event said bit of the scramble sequence has said second binary value.

12. Apparatus in accordance with claim 11, wherein said counterclockwise rotation comprises a ninety degree rotation.

13. A method for encoding data for use in digital communications systems comprising the steps of:

encoding data to be communicated over a communication channel using a binary convolutional code; and

scrambling codewords provided by said binary convolutional code prior to transmission over said communication channel.

14. A method in accordance with claim 13 comprising the further step of encoding said codewords jointly onto in-phase (I) and quadrature (Q) channels.

15. A method in accordance with claim 13 comprising the further steps of:

mapping said codewords to a constellation according to a pseudo-random scramble sequence comprising bits having one of first and second binary values;

in the event a bit of the scramble sequence has said first binary value, maintaining said constellation in a current relationship with respect to constellation axes; and

in the event a bit of the scramble sequence has said second binary value, rotating said constellation.

16. A method in accordance with claim 15, wherein said constellation is rotated counterclockwise in the event said bit of the scramble sequence has said second binary value.

17. A method in accordance with claim 16, wherein said counterclockwise rotation comprises a ninety degree rotation.

18. Apparatus for encoding data for use in digital communications systems comprising:

a binary convolutional encoder for processing said data using one of a 64-state, rate 1/2 binary convolutional code (BCC) based on octal generators 133, 175 or a 256-state, rate 2/3 BCC based on octal generators $\begin{pmatrix} 21,02,12 \\ 10,25,12 \end{pmatrix}$ to provide binary convolutional coded codewords.

19. Apparatus in accordance with claim 18 wherein:

said codewords are mapped to a constellation according to a pseudo-random scramble sequence comprising bits having one of first and second binary values;

in the event a bit of the scramble sequence has said first binary value, maintaining said

constellation in a current relationship with respect to constellation axes; and

in the event a bit of the scramble sequence has said second binary value, rotating said constellation.

20. Apparatus in accordance with claim 18 further comprising a scrambler for scrambling codewords provided by said encoder prior to transmission over a communication channel.